ordinary skill in the art would readily appreciate based on the disclosure, using four signaling levels, rather than the two signaling levels traditionally used for digital signaling, two bits of information can be conveyed simultaneously over a single conductor (e.g., using the four signaling levels to denote all four possible dibit values 00, 01, 10, and 11). Also, one of ordinary skill in the art would readily understand from the disclosure that the use of a receiver with multiple voltage or current level thresholds would allow the four signaling levels to be correctly identified, thereby allowing the two simultaneously-transmitted bits to be accurately received. Applicant notes that the use of four signaling levels and/or two simultaneously-transmitted bits is merely exemplary, and that embodiments of the invention are not limited to the use of such levels and/or bits. Thus, applicant submits that the Examiner's objection has been obviated and that claims 6 and 16 are in condition for allowance.

The Examiner has rejected claim 9 under 35 U.S.C. § 102(b) as being anticipated by Lacroix, et al. (U.S. Patent No. 4,727,540). Applicant respectfully disagrees. The Examiner cites col. 10, lines 3-65, of Lacroix, et al., which constitutes claim 3 of the Lacroix, et al. reference. Applicant submits that Lacroix, et al. fail to disclose the claimed invention as set forth in claim 9. For example, applicant submits that Lacroix, et al. fail to disclose the step of "generating a receive repeating pattern in the receive circuit," as Lacroix, et al. describe merely "a comparator for comparing two binary numbers having the length of the pattern, one of said binary numbers being identical to a pattern and being hardwired." Thus, one input of the comparator of Lacroix, et al. is merely hardwired, with no step of generating a receive repeating pattern being performed. Thus, Applicant submits that claim 9 is in condition for allowance.

The Examiner has rejected claims 1-5, 7-8, 10, 12-15, and 17-21 under 35 U.S.C. § 103(a) as being unpatentable over Lacroix et al. (U.S. Patent No. 4,727,540). The Examiner states that Lacroix, et al. do not disclose the operating mode as a test mode, but argues that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lacroix to have a test mode to be able to test for a status of the subject. Applicant acknowledges Lacroix, et al.'s lack of a test mode, but respectfully disagrees with the Examiner's conclusion. Applicant submits that Lacroix, et al. fail to suggest the claimed invention, as set forth in claims 1-5, 7-8, 10, 12-15, and 17-21. For example, regarding claim 1, Lacroix, et al. fail to disclose a receive repeating pattern generator for the reasons set forth above in reference to claim 9. As another example, regarding claim 2, Lacroix, et al. fail to disclose a transmit shift register. As yet another example, regarding claim 3, Lacroix, et al. fail to disclose a digital signaling system "...wherein a transmit shift register output of the transmit shift

register is coupled to transmit shift register input of the transmit shift register...." As a further example, Lacroix, et al. fail to disclose a digital signaling system wherein "...a receive shift register output of the receive shift register is coupled to a receive shift register input of the receive shift register...." As yet another example, regarding claim 4, Lacroix, et al. fail to disclose a transmit linear feedback logic gate as recited in claim 4. As an additional example, regarding claim 4, Lacroix, et al. fail to disclose a receive linear feedback logic gate as recited in claim 4. As further example, regarding claim 5, Lacroix, et al. fail to disclose either a transmit repeating pattern generator that "comprises a transmit linear feedback shift register" or a receive repeating pattern generator that "comprises a receive linear feedback shift register" as recited in claim 5.

Regarding claims 7 and 8, applicant notes that Lacroix, et al. states in column 2, lines 58 and 59, that "[t]he remote signaling described below is applicable to an optical fiber digital transmission link...." Thus, Lacroix, et al. teaches away from a digital signaling system "wherein the transmit data output signal is communicated over a single conductor referenced to a ground voltage" as recited in claim 7. Lacroix, et al. also teaches away from a digital signaling system "wherein the transmit data output signal is communicated as a differential signal over two conductors" as recited in claim 8.

Regarding claim 10, applicant can find nothing in Lacroix, et al. to suggest the step of "adjusting a parameter affecting operation of the transmit circuit based on the comparison" as recited in claim 10. Regarding claim 12, applicant can find nothing in Lacroix, et al. to suggest the step of "utilizing a shift register to generate the transmit repeating pattern." Regarding claim 13, applicant can find nothing in Lacroix, et al. to suggest the step of "utilizing a linear feedback shift register to generate the transmit repeating pattern." Regarding claims 14 and 15, applicant submits that Lacroix, et al. teaches away from claims 14 and 15 for the same reasons presented above with reference to claims 7 and 8.

Regarding claim 17, applicant can find nothing in Lacroix, et al. to suggest the step of "adjusting a receiver characteristic of the receive circuit" as recited in claim 17. Regarding claim 18, applicant can find nothing in Lacroix, et al. to suggest adjusting a receiver characteristic selected from a group consisting of a receive circuit timing signal and a voltage reference. Regarding claim 19, applicant can find nothing in Lacroix, et al. to suggest the step of "determining boundary values of the receiver characteristic within which reliable operation of the system is provided" as recited in claim 19. Regarding claim 20, applicant can find nothing in Lacroix, et al. to suggest the step of "adjusting a parameter affecting operation of the transmit circuit based on the boundary values" as recited in claim

20. Regarding claim 21, applicant can find nothing in Lacroix, et al. to suggest adjusting a parameter selected from a group consisting of an output current, a crosstalk cancellation coefficient, and a self-equalization coefficient. In fact, the Examiner has stated that "...Lacroix disclose a method including the subject matter discussed above except a crosstalk cancellation and self-equalization...."

Therefore, regarding claims 1-5, 7-8, 10, 12-15, and 17-21, Lacroix et al. fails to disclose or suggest the claimed invention as recited in these claims. Thus, applicant submits that claims 1-5, 7-8, 10, 12-15, and 17-21 are in condition for allowance.

The Examiner has rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Lacroix, et al. as applied to claims above, and further in view of Bremer (U.S. Patent 6,160,790) and Iwata, et al. (U.S. Patent 5,999,022). The Examiner states that Lacroix, et al. disclose a method including the subject matter discussed above except a crosstalk cancellation and self-equalization. The Examiner further states that "Bremer and Iwata disclose such application (Bremer col. 5, lines 43-62), to have an overlapping frequencies application (Bremer col. 2, lines 44-55), (Iwata, col. 11, lines 15-28), to have a low power consumption system (col. 4, lines 21-25)." The Examiner also states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lacroix to have the usage of crosstalk cancellation coefficient and self-equalization coefficient in order to have an overlapping frequencies application and to have a low power consumption system."

Applicant respectfully disagrees. Bremer, in col. 2, lines 44-48, states that "...the invention is a crosstalk canceller (CC) system and method for a transceiver bank for reducing crosstalk between first and second communications channels having overlapping frequencies and respective physical connections in a communications device..." Applicant can find nothing in Lacroix, et al. to suggest the existance of "crosstalk between first and second communications channels having overlapping frequencies." In fact, the refractive indicies and consequent total internal reflectance of an "optical fiber digital transmission link" (col. 2, line 59 of Lacroix, et al.) would be expected to prevent such crosstalk and obviate any alleged motivation to combine the Lacroix, et al. and Bremer references or to modify the teachings of Lacroix, et al. based on the teachings of Bremer. Iwata, et al., in col. 11, lines 17-19, state that "...the differential amplifier is in a state of self-equalization. In this state, an ordinary differential amplifier does not operate correctly." Thus, applicant submits that Iwata, et al. teach away from the modification of the teachings of Lacroix, et al. because, firstly, Lacroix, et al. do not appear to teach the use of a differential amplifier and, secondly, even if Lacroix, et al. were to teach the use of a differential amplifier, modification of Lacroix, et al. regarding "self-equalization" based on Iwata, et al.

would be expected to produce a result that "does not operate correctly." Thus, applicant submits that Lacroix, et al. and Iwata, et al. are non-analogous art for which no suggestion in the prior art exists to suggest that they be combined to yield the claimed invention, nor, in fact, would they yield the claimed invention if an attempt were made to combine them or to modify the teachings of Lacroix, et al. based on the teachings of Iwata, et al. Therefore, Applicant submits that claim 11 is in condition for allowance.

In conclusion, Applicant has overcome all of the Office's rejections, and early notice of allowance to this effect is earnestly solicited. If, for any reason, the Office is unable to allow the Application on the next Office Action, and believes a telephone interview would be helpful, the Examiner is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

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